REMARKS

Claims 1 – 25 remain in the application. Claims 3 – 10, 14 – 17 and 21 – 25 are objected to. Claims 1, 2, 11 – 13 and 18 – 20 stand finally rejected. By a proposed amendment offered herein, claims 3, 14 and 21 are canceled and rewritten as new claims 26 – 28, respectively. An amendment to claims 4, 8, 15, 17 and 22 is offered herein. The final rejection of claims 1, 2, 11 – 13 and 18 – 20 is respectfully traversed.

Claims 3 – 10, 14 – 17 and 21 – 25 are objected to for depending from a rejected base claim but, the Examiner indicated would be allowable, if amended or rewritten to independent form to include the recitations of the rejected base claims. Claims 3, 14 and 21 are canceled by the proposed amendment included herein and rewritten as offered new claims 26 – 28, respectively, and so are allowable. Similarly, the proposed amendment to claims 4, 15 and 22 modifies dependency to depend from allowable claims 26 – 28, respectively. The proposed amendment to claims 8 and 17 is formal in nature, i.e., to add a period at the end of each claim. No new matter is added. The applicants respectfully request that the Examiner enter the proposed amendment, reconsider and withdraw the objection and allow claims 26, 4 – 10, 27, 15 – 17 and 28, 22 – 25.

In finally rejecting claims 1, 2, 11 – 13 and 18 – 20 under 35 U.S.C. §103(a), the Examiner essentially repeats the previous rejection, asserting that claims 1 and 2 are unpatentable over Ibe et al. (U.S. Patent No. 6,437,804) and that claims 11 – 13 and 18 – 20 are unpatentable over Ibe et al. in combination with Blainey et al., "Loop Allocation for Optimizing Compiler." The final rejection is respectfully traversed.

Accordingly, the Examiner continues to assert that, essentially, Ibe et al. teaches the invention as claimed in finally rejecting claims 1 and 2. The Examiner summarizes the applicants' arguments set forth in the previous response as twofold, namely: that "(1) 'Neither can the applicants find any mention or suggestion in Ibe et al of dominant edges, much less an indication of how to find dominant edges in edge weight graph such that

dominant edges are not present in the minimum cut. (2) 'This is not assigning weights to the edges'." (sic). The Examiner responds asserting that

> As to the point (1), Ibe teaches the suppernode is identified since the weigh of clusters again are determined if the weight of every cluster lies within the range defined, col 13, ln 7-40/ ln 50-67/combining the nodes into a number of control groups which number is the same as the number of domains, col 2, ln 55-60), each cluster node can be identify based on the weigh of node but the weigh can be assigned to the edge so the each cluster node can be identify to place into the domain based on the weigh of edges(col 2, ln 15-24/col 6, ln 40-46). (sic)
>
> As to the point (2), Ibe teaches edges or node be assigned a weigh (col 6, in 35- 65). (sic).

Apparently, the Examiner is asserting that an Ibe et al. supernode is equivalent to or identifies a dominant edge; that nodes can be clustered according to edge weights; and, that this is equivalent to "determining a min cut solution for said communication graph, dominant edges being excluded from determined min cut solutions" as recited in step (c) of claim 1.

Ibe et al. clearly recites that

> the network is modeled by a weighted graph in which the nodes of the graph denote the switches, the edges of the graph denote the communication links, and the **weight of a node of the graph denotes the number of ports** each node supports. Thus, two nodes of the graph will be adjacent (i.e., connected by an edge) if the two switches they represent are connected by a link, i.e., a communication channel which may be a physical link such as a cable (optical, electrical or otherwise),

at col. 5, lines 55 – 62 (emphasis added). "A node on which a control agent is attached is defined as an 'anchor node.'" Col. 6, lines 24 – 25. Ibe et al. defines a supernode as "a set of nodes that are mutually adjacent to one another and there is no weak edge between any two members of the set (i.e. a fully connected graph with no weak edges)." Col. 8, lines 8 – 11. "'Cluster' simply refers to a set of nodes. In one embodiment, clusters are simply different sets of nodes that are formed and then adjusted until an acceptable partitioning of the graph is identified." Id, lines 16 – 19. Furthermore, a discussion of clusters and cluster weights provides in pertinent part that:

> The weight of each cluster is determined by adding the weights of each node in the cluster (i.e., at step 19). If a node is in more than one cluster

> (step 21), it is assigned to a cluster according to the following scheme (step 23): Initially, the node is attempted to be assigned to the cluster with the lower weight. However, if the common node is in a supernode with an anchor node, it is assigned to the cluster in which the anchor node is located. If neither of the above options is possible, if the common node is in every supernode of a cluster with the cluster's anchor node, the node is assigned to that cluster. An example of this case is shown in Example 6 below. Cluster weights then are updated (step 19).

at col. 12, lines 32 – 43. Additionally, the Ibe et al. "method attempts to both balance the weights of the clusters and ensure that each node is adjacent to at least two other nodes in the cluster." Col. 13, lines 24 – 26. In other words, Ibe et al. is trying to ensure that node triplets are formed into supernodes; that each node has at least 2 edges attached to it and the number of ports each cluster supports, as indicated by that the sum of the cluster node weights, is essentially the same for all of the clusters. It is clear that if weights are assigned to edges, those weights would be somehow determined by the number of ports at the nodes connected to the edges, not by the communication between the nodes connected by the edges.

As is clearly recited on page 6, lines 17 – 21 of the present application:

> Each facet of the task is an independent task or object that is represented as a node and communication between tasks or nodes is represented by a line (referred to as an edge) between respective communicating nodes. Participating individuals (individuals receiving and executing distributed tasks) are referred to as terminal nodes or machine nodes.

Thus, an edge is a line segment between a pair of nodes, i.e., two and only two. So, while any number of edges can be connected to a node, each such edge can only be connected to one other node. Further, claim 1 clearly recites that "task components represented as nodes of said communication graph and edges connecting ones of said nodes, said edges representing communication between connected nodes and being **weighted proportional to communication between connected nodes**" at lines 3 – 6 (emphasis added). Furthermore, "for any non-terminal node a connected edge is dominant if it is at least as heavy (i.e., its weight is greater than or equal to) as the sum of the remaining non-terminal edges and the heaviest of the remaining terminal edges." Page 10, lines 16 – 18. Thus, communication over a dominant edge is at least as heavy (highest weight, where

weight is proportional to communication) as the communication through all of the other edges connected to the same non-terminal node. Accordingly, as previously noted, there is nothing in Ibe et al. or any other reference of record to teach or suggest identifying dominant edges, i.e., edges with a weight that is greater than or equal to the *sum* of the remaining non-terminal edges. Stated another way, for any node, the weight of a dominant is at least half the sum of the weights of the edges attached to that node.

The applicants note that it is very likely that the weight of some dominant edges will be less than that of some non-dominant edges. In particular, as provided in the specification on page 9, lines 10 – 14,

> in the example of Fig. 2C, the sum of the weights of edges 124, 126, 128, 132 and 138 is 2090, which is cost of the cut and is representative of the total number of messages that would be sent between machines at terminal nodes 140, 142, 144 with this particular placement. The min cut identifies the optimum component placement with respect to component communication.

Clearly, there is no port allocation balance considered in this weighting. Also, edge 134 is dominant for node 144. *See also*, page 10, lines 9 – 25 and Figure 4. The applicants note that as described in Ibe et al., nodes 112, 114, 122 or 114, 116 and 118 would be combined into a supernode. Further, weighting edges instead of nodes and using the criteria described by Ibe et al., would allocate weights to edges 146, 148 and 150, connected to terminal nodes 140, 142, 144, with the remaining edges 124 – 138 being unweighted. Thus, clustering these nodes as described by Ibe et al. significantly changes the result in this example. Clearly, Ibe et al. is quite different than the present invention as recited in claims 1 and 2.

So, regarding the Examiner's apparent assertion that the present invention as claimed in claims 1 and 2 results when point (1) is combined with point (2), i.e., instead of nodes, edges are weighted proportionate to the number of ports, a dominant edge is not a superedge and not identified by such a weighting. Neither is there anything in Ibe et al. that would lead one to assign weights to edges based on communications and determine

"a min cut solution for said communication graph, dominant edges being excluded from determined min cut solutions" as recited in claim 1.

An obviousness rejection cannot be based on the resort of the Examiner to the combination of bits and pieces of the references in the light of Applicants' teachings. An extensive discussion of the criteria to be applied in obviousness rulings is set forth in *Aqua-Aerobic Systems Inc. v. Richards of Rockford Inc.*, 1 U.S.P.Q. 2d 1945, 1955-57 (N.D. Ill. 1986). "The fact that a prior art reference can be modified to show the patented invention does not make the modification obvious unless the prior art reference suggests the desirability of the modification. An attempted modification of a prior art reference that is **unwarranted by the disclosure** of that reference is improper." *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) (emphasis added). *See also, In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.).

However, since as set forth hereinabove, a straightforward modification of Ibe et al., as suggested by the Examiner instead of nodes, i.e., weighting edges proportionate to the number of ports does not identify dominant edges and does not result in the present invention as claimed in any of finally rejected claims 1 – 25. Otherwise weighting edges and then, clustering as described in Ibe et al. to result in thepresent invention can only be achieved by picking and choosing bits and pieces of Ibe et al., aided by the teaching of the present application. Such a use of the application in hindsight as a template to modify Ibe et al. is improper. Therefore, because modification of Ibe et al. as suggested by the Examiner does not result in the present invention; because the Examiner can only be using the present application in hindsight as a template to modify Ibe et al.; and because there is no suggestion in Ibe et al. to modify or how to modify, Ibe et al. does not teach or suggest the present invention as claimed in claims 1 and 2. Accordingly, claims 1 and 2

are patentable over Ibe et al. under 35 U.S.C. §103(a). Reconsideration and withdrawal of the final rejection of claims 1and 2 over Ibe et al. under 35 U.S.C. §103(a) is respectfully solicited.

Concerning the rejection of claims 11 – 13 and 18 – 20 over Ibe et al. in combination with Blainey et al., as has been previously noted, Blainey does not add anything to Ibe et al. to result in or suggest the invention as claimed in claims 1 and 2, much less claims 11 – 13 and 18 – 20. Therefore, claims 11 – 13 and 18 – 20 are patentable over the combination of Ibe et al. and Blainey et al. under 35 U.S.C. §103(a). Reconsideration and withdrawal of the final rejection of claims 11 – 13 and 18 – 20 over the combination of Ibe et al. and Blainey et al. under 35 U.S.C. §103(a) is respectfully solicited.

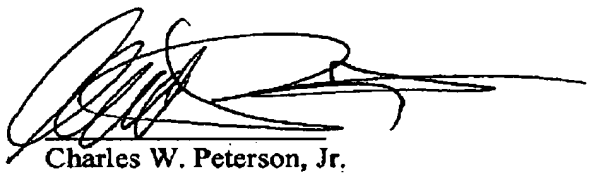
Accordingly, because Ibe et al., either alone, in combination with Blainey et al. or any reference of record does not result in the present invention, the present invention is not obvious under 35 U.S.C. § 103(a). Reconsideration and withdrawal of the final rejection of claims 1, 2, 11 – 13 and 18 – 20 under 35 U.S.C. § 103(a) over Ibe et al. alone and further in combination with Bailey et al. is respectfully solicited.

The applicants thank the Examiner for efforts, both past and present, in examining the application. Believing the application to be in condition for allowance, both for the proposed amendment of the claims and for the reasons set forth above, the applicants respectfully request that the Examiner enter the amendment to the specification and claims, reconsider and withdraw the objection to claims 26, 4 – 10, 27, 15 – 17 and 28, 22 – 25, reconsider and withdraw the final rejection of claims 1, 2, 11 – 13 and 18 – 20 under 35 U.S.C. §103(a) and allow the application to issue.

Should the Examiner believe anything further may be required, the Examiner is requested to contact the undersigned attorney at the local telephone number listed below for a telephonic or personal interview to discuss any other changes.

Please charge any deficiencies in fees and credit any overpayment of fees to IBM Corporation Deposit Account No. 50-0510 and advise us accordingly.

Respectfully Submitted,



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